

CLAIMS

1. A method for increasing the bearing capacity of foundation soils for buildings comprising: providing a plurality of holes (1) spaced from each other deep in the soil; injecting into the soil, through said holes, a substance (3) which expands as a consequence of a chemical reaction; producing compaction of the soil contiguous to the injection zone due to the expansion of said substance injected into the soil, characterized in that it further comprises the step of constantly monitoring the level of the soil and/or building overlying the injection zone to detect the moment when the building and/or the soil surface, overlying said injection zone, begins to raise which is the moment in which the compaction of the soil has reached levels generally higher than the required minimum value, and in that the expansion of the injected substance is very fast with a potential increase in volume of the expanded substance being at least five times the volume of the substance before expansion.

2. A method according to claim 1, characterized in that the injecting step is repeated at different depth levels for producing compaction of the masses or layers of treated soil.

3. A method according to claim 2, characterized in that said different depth levels are spaced by approximately 1 m from each other, at each level a greater bearing capacity than the required one being obtainable.

4. A method according to any of the preceding claims, characterized in that said monitoring step is performed with a laser level apparatus (5).

5. A method according to any of the preceding claims, characterized in that said holes (1) are provided vertically, the injection steps being performed continuously along rising columns wherein tree-like shapes are formed with a very irregular configuration with protrusions, bumps and projections of considerable size produced by different resistance to compaction of the soil, and by the presence of interstices or fractures in the

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soil.

6. A method according to any of the preceding claims, wherein the entire thickness of the soil layers which are compressible or have low bearing capacity is treated so as to perform consolidation up to the solid horizon of the layers having a sufficient bearing capacity regardless of the depth at which the solid horizon is located.

7. A method according to any of the preceding claims, wherein the expandable substance is selected from substances adapted to produce immediate expansion, such as a substance comprising a mixture of polyols and an isocyanate MDI.

8. A method according to claim 7, wherein the expandable substance comprises a mixture of two components, the first being a polyether polyol and/or a polyester polyol, a catalyst and water, and the second being the isocyanate MDI.

9. A method according to any of the above claims, characterized in that the distance between two adjacent holes is between 0.5 m and 3 m.

10. A method according to any of the claims 1-4 and 6-9, characterized in that said holes (1) are provided at an angle with respect to the vertical.

11. A method according to claim 1, wherein the injection step comprises several active injection phases alternated with suitable pauses.

12. A method according to one or more of the preceding claims, wherein the injection substance is heated just before the injection step.

13. A method according to claim 8, wherein the water content is of 3.44%, by weight.

14. A method according to one or more of the preceding claims, wherein in the injection step, tubes (2) are used through which the expandable substance is injected into the soil, the tubes having an inner diameter of about 10 mm.

add A' / add C6 / add D2 / add E1

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